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VOLUME XIX NUMBER THREE

TABLE OF CONTENTS, AUG.-SEPT., 1933

O. K. 3

Jeff, in Washington, Makes Some Pertinent Observations on the Subject

Tomato Yield and Quality 7

L. M. Youngblood Tells How They Are Obtained

Southwest Soils Are Showing Potash Deficiency 8

A Fertility Story, by Eugene Butler

A Soil Exhibit Carrying a Story 11

Henry G. Bell Describes an Exhibit Which Created Great Interest

The Inquiring Mind and the Seeing Eye 12

Another of Dr. Alexander's Series, in Which He Pays Tribute to Dr. Milton Whitney

Editorials 19

Reviews 21

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY., INC.

of Amsterdam, Holland

Directors: J. N. HARPER G. J. CALLISTER

PLANE MANEUVERS AND BUCKINGHAM FOUNTAIN AT NIGHT,
GRANT PARK, CHICAGO

Better Crops with PLANT FOOD

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VOL. XIX NEW YORK, AUG.-SEPT., 1933 No. 3

O. K.

By Jeff McDermid

Jeff, in Washington, sees humor as well as pathos in obtaining the much-needed approval of the government these days.

HERE I sit on a hot evening in soggy Washington, in wrinkled linens on a bench in Lafayette park. "Right ferninst" me (all rarin' to proceed but never advancing) towers the iron-faced equestrian, General Andrew Jackson, whose laconic abbreviation of "all correct" is credited with the origin of O. K. He seems to be gazing with speculative eye at the house across the park between the magnolia vistas, where in glorious, hair-pulling days of yore he himself instituted a New Deal. The paper on which he scribbled the famous misspelled comment on which we base our present lives as Federal clerks, paymasters, and journalists has long since been scattered to the winds and the dust. But within the white mansion house today there sits a successor to Jackson in the long line of O. K. artists who have used up tons of stationery for such purposes.

One who has had experience can take a short subject like O. K. and make quite a screed out of it. I presume I could have done this readily before joining the ranks of patient O. K. seekers who hang around so woefully in the corridors of the national capitol. But now I can speak with the voice of the expert and relate the circumstances with all the ardor of one who has suffered chagrin, discomfort, terror, and pride in the throes of this big game business at Washington—the hunting and capturing of O. K.'s alive. It also means that "big fists" whether armed in mail or gloved in silk have moved over the same sheet bearing your ambitious message. It gives you a better conception of the intricacies and the fine points of persuasion, if not evasion.

The Bible does not state who it was that inspected the world, the void, and Father Adam for the final O. K. As for Eve, Adam attended to that. The Good Book says so. But since Adam's time the gentle sex has assumed most of his original prerogatives in the line of making final decisions.

IT is difficult to establish exactly what an O. K. means because it has different interpretations among different people. What is O. K. to me may be N. G. to you. Literally it means satisfying the Boss, the Chief. It is the most elusive of all currencies because it has no standard.

O. K. means validity to the financier; accuracy to the journalist; relevancy and conformity to the lawyer; harmony to the musician; a good guess with flowing curves to the economist; and 3.5 per cent to the thirsty.

There are two factors involved in any O. K. One is the OK-or and the other is the OK-ee. At first thought one prefers to be the former, but in reality the latter gets the most education out of it. In those alluring pictorial advertisements that were current in pre-depression days, the smug and contented Principal Supervisor sat behind a glossy desk holding a sheet of paper with pencil poised in suspended cogitation. Across the room in hang-dog attitude stood the underling in baggy pants and dejected mien, patiently waiting for the man who had taken Our Correspondence Course in Personality to announce his fiat. Here was the embodiment of enthroned majesty and power in the shape of a Successful and Potent OK-or, contrasted with the abject figure of the OK-ee. All one had to do to become an OK-or was to exert will power and bluff so as to rise triumphant from the submerged horde of OK-ees.

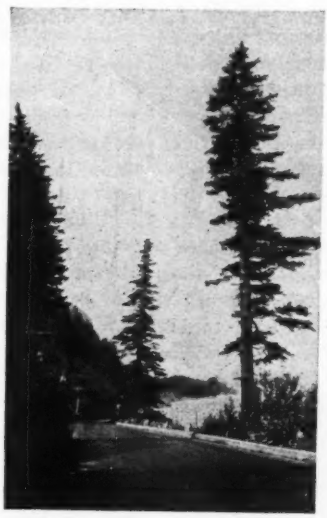
Unfortunately they did not let us behind the scenes. They did not make it clear that the OK-or was up against it worse than the OK-ee. All he or any other OK-or can do with a problem or a parchment laid before him is to determine two things, viz. and to wit: (1) Does this thing sound the way I want it to sound? (2) If so, am I sure it will sound right to the million other unknown OK-ors who must ultimately settle the problem—the ultimate consumers as it were?

That goes for either publicity or policies. You write a story or draft a statement, making sure of the elemental accuracy of the dates, names, and places; and then submit it to the OK-or. If it is a limp and spineless piece that would not disturb anyone, the rubber stamp is easy to affix. But if it contains the least germ of an idea, the smallest iota of a challenge to intelligence or reason, the tiniest threat of varied opinion—in other words, if it has character—the task of the bewildered OK-or is indeed no sinecure. He wonders how much the poor OK-ee knew and held back; what disturbance the sketch would cause to friends and enemies; and whether it breeds a dunce cap or a diadem for him.

AT this juncture of contact between OK-or and OK-ee the world holds its breath; jobs tremble in the balance; and the w. k. Blue Eagle flaps its wings and prays for recovery. In short, at this meeting between the

upper and nether millstones of mentality during the O. K. process there is often danger that truth, crushed to atoms, will rise no more. Coming into the various complexities of this check and double-check trade, let us review a few classifications.

Of all forms of approval known to man that of the Multiple O. K. is the toughest. First, you go to all of the bosses and the experts and get their jumbled opinions on a given situation. No two of the opinions may be remotely alike, but that makes a dandy jig-saw for you. Then we sit down with the thesaurus and the Marquis of Queensberry rules and wrestle something down on paper. After the process is completed you take some aspirin and make sixteen carbon copies. No matter if the last four are illegible. The office boy can O. K. them.



Then you begin the marathon, the stalking process, the seat-warming, and stalling. No. 1 OK-or is at lunch; No. 2 is in conference with the other seven; and four more have hid. After a couple of days you corral half of them and get the piece all rewritten nicely. It is re-referred to the other half and they ask the lawyers in. The legal fraternity ask for a mandamus or a stay or something, shoot it full of commas, insert forty-five parentheses, and then ask you if you can read it. Not being able to, you go back and hunt up the original from the office boy, copy it again, and file it somewhere. When everybody has forgotten the topic, you keep it handy until the wind shifts. Then you release it and divide the credit where it doesn't belong.

Secondly, we have the tantalizing Delayed O. K. Most of these in the opinion of the hapless OK-ee are due to meanness and swivel-chair indifference. In truth many of them are caused by the fact that the OK-or is afraid to make up his mind. Nine times out of ten a delayed O. K. is better than one that is issued, because it gets nobody in bad and gives plenty of employment in the meantime, such as it is. Pool tables and dice would be handy adjuncts in extreme cases of Delayed O. K. Others might prefer pocket chess.

Finally we reach the Casual-Careless O. K. This holds extreme danger for the OK-ee, but it usually emanates from the office of one who holds his job lightly or doesn't give a cuss what happens anyhow. However, if he initials the document under the watchful orb of the OK-ee, his responsibility is fixed. To the free-lance with enthusiasm and verve, the contact made with this kind of an OK-or is a pleasure. It makes the OK-ee feel more like an original creator.

An irritating specimen of the OK-or is the Pass-the-Buck variety. He reads the copy, makes a few comments and scratches, and then says "If this satisfies So-and-So, my lad, it's jake with me." When So-and-So is in jail or on a vacation it means more frustration.

We suspect that the custom of the O. K. is a direct outgrowth of feudalism and militarism. Socialists abhor it; communists claim to but don't. Decisions are needful for leadership and marching orders must perforce be issued somewhere.

Probably the custom of the O. K. therefore grew out of war and politics, and has become grafted onto business. It had its birth in expediency or

strategem. In this connection we can observe with interest what happens when two rival O. K. orders meet. It happens in every campaign, whether of bullets or ballots. The generalissimo issues his ukase; the subalterns hasten to execute it; prayers go up to all sorts of gods in its behalf; the forces gather in confidence that each is right; the clash comes—and one of the O. K.'s wilts in defeat and becomes twisted around into a K. O. "The best laid plans of mice and men . . . ."

ANOTHER form of O. K. that is of the doubtful order is that of established custom or common consent. Unwritten laws, the customs of a people, legends, fetishes and hero-worship all belong in that list. They are varying, evanescent, intangible but often more powerful to sway multitudes than more substantial motives. When resisted in circles of earnest devotees by skeptics, these popular O. K.'s breed feuds and hatreds. Instances of the vagary arising from them are numerous.

The man who fairly worshipped Lindbergh turned away in a rash of bitterness when the pilot married an heiress. John L. was the pride of every bar-room until he met Gentleman Jim. Your pennant-leading team was popular until an error in the tenth with bases full. The O. K. applied under such circumstances has a feeble hold on life. It runs by the rule o' thumb —thumbs up or thumbs down!

Most amusing and least injurious of this class are the O. K.'s of legendary origin. In two short jaunts from Washington of late two of these have been noted. At Frederick, Maryland, they feature with flags and curios the little creek-side house of one Barbara Fritchie. They recite the sonorous poem about Stonewall Jackson and his brigade and make a shrine of the domicile where nothing of the kind occurred. At Ferry Farm near Fredericksburg, Virginia, you are introduced to a gnarled stump of a dead cherry tree which, they say, is the remains of that famous hatchet incident wherein the Father of His Country is held up as a Truthful James. Strung along all highways from Maine to Florida are colonial mansions that once housed Lafayette or General George. Rather disturbing to faith in the O. K.

Most disheartening of the O. K. list in this line is that of conventionality. When we were young, you recall, there were some few women of the town that our mothers shunned. Yet somehow, these lively tinted creatures back in those days of pale femininity were kind and thoughtful toward little folks like us. In many cases we trusted them and liked them far better than we did Deacon Jones or Aunt Jerusha of the Sunday school. Childish instinct has a way of forgiving many things and seeing beyond many errors to the core of reality and the heart within.

Thus we must admit that what is popular, what is applauded for the moment, or what is abjured or abused does not make a very firm or stabilized kind of O. K. Even the battle or the ballot does not establish the ultimate victory or vindication of such an O. K. Nor the lecture, the sermon, or the trip to the wood-shed with Dad.

IF we turn with some degree of expected relief to the O. K. on facts and events, we are none the less perplexed. I know well the rule of the print shop and the editorial sanctum about accuracy and the answers to who, what, when and why. But send three men to a convention or a train wreck or a wake and upon their return ask them each and severally to set down what they saw. The human equation will then bob up and give you three news stories to choose from and on which to take a chance with an O. K.

Does the test of the O. K. resolve into being true to yourself? The answer is that it does if you are heart and soul in tune and in concert with

(*Continued on page* 31)

Tomato Yield *and* Quality

By L. M. Youngblood

County Agent, North Vernon, Indiana

INDIANA has established an enviable reputation for canned tomatoes, and a liberal portion of the State's output is packed in southern Indiana. One canner expressed the kernel of the nut in this statement, "The only canners who can pack quality into a can are those whose growers deliver quality tomatoes to his factory."

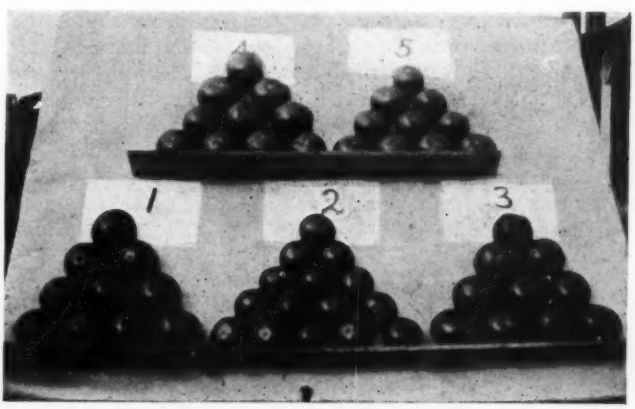
Southern Indiana growers are keenly alert for anything new that will aid them to grow more bushels of higher quality tomatoes and they perform many experiments on their own farms.

In 1930 one grower tried adding potash to his regular 2-12-6 fertilizer, an analysis which has long been a standby among Hoosier tomato growers. When the plants came on and into fruit, he thought the vines were more thrifty, that they bore a more profuse "set" of tomatoes and that the tomatoes were redder, more solid, and smoother. He called in some of his neighbors and the County Agent and they too detected the same improvements he had noticed. At the end of the season he not only had better tomatoes, but picked them all, while several of his neighbors still had unripe tomatoes in their patches.

In 1931, other growers tried this same principle of adding more potash in their tomato fertilizers and they were delighted with the greatly increased yields and the 50 per cent or more improvement in grades.

Grover Bear, a 4-H Club boy, had out two acres of tomatoes in 1931. His tomato ground is Clermont silt loam, a light-colored, fine-grained, heavy soil; and it had been manured with about 8 tons per acre. He used 500 pounds of 2-12-6 per acre on the entire field, the regulation dose of fertilizer recommended by the canneries. Then on ½ acre he used in addition

(*Turn to page* 27)



Nos. 1-2-3 tomatoes were taken from plots which received extra potash. Nos. 4-5 were fertilized with only the regular 2-12-6 fertilizer. Note the larger fruit and better color produced by the extra potash.

Southwest Soils Are Showing Potash Deficiency

By Eugene Butler

Editor, *Progressive Farmer and Southern Ruralist*, Dallas, Texas

FARMERS in this neck of the woods are meeting increasing difficulty in growing profitable crops without potash.

When I came to Texas a dozen years ago, the use of commercial fertilizer was regarded by the great majority as prima facie evidence of poor farming. Even in the ranks of those who realized the economic soundness of crop fertilization, of the three elements of essential plant food, potash was held in least esteem. Soil authorities were in agreement that there was little need for potash in the fertilization of general field crops. It was generally recommended that "clay soils and soils with clay or loam subsoils need little potash for ordinary farm crops, but that light sandy soils with sandy subsoils *may* need potash." Such was the recommendation published September 1923 in Bulletin No. 312 of the Texas Experiment Station.

Indeed there was considerable evidence back in those days that even potash-loving crops such as Irish and sweet potatoes could be fertilized most profitably without the use of any appreciable amount of potash. East Texas experiments from 1902 to 1911 with fertilizers for sweet potatoes, Irish potatoes, and strawberries indicated a marked deficiency in phosphoric acid and nitrogen but a very slight one in potash. With Irish potatoes, nitrogen and phosphoric acid gave greatest profit, although potash was beneficial to some extent. In fertilizing sweet potatoes, a mixture of three parts of superphosphate and two parts cottonseed meal, which analyzes about 2.75 per cent nitrogen, 10 per cent phosphoric acid, and ¾ of one per cent potash, was recommended. In strawberries, a mixture of cottonseed meal and superphosphate was found most profitable; potash did not pay. In fact, there seemed to be little place for potash in the fertilization of crops in the Southwest in the first quarter of the 20th century.

Times Have Changed

Times have changed. No one would now think of buying a fertilizer for truck crops that did not contain a liberal supplement of potash. And we are finding that many of those soils that formerly would grow cotton successfully when supplied with nitrogen and phosphoric acid must now have potash in their ration before they will turn out good crops. Work in recent years by N. V. Potash Export My., Inc., and the Texas Experiment Station indicates that potash has come into the crop fertilization picture in a very definite way.

For three years, 1929, 1930, 1931, N. V. Potash, under the direction of John S. Carroll and Carl Tanner, conducted a very comprehensive series of tests with the farmers of East Texas,

Sandy loam soil on the farm of H. R. White, Henderson, Texas
Left: 600 lbs. 6-8-0 per A. Yield: 369 lbs. seed cotton per A.
Right: 600 lbs. 6-8-4 per A. Yield: 531 lbs. seed cotton per A.

using potash under cotton and also as a top-dressing.

In 1929, 600 pounds per acre of 6-8-4 gave an increased yield over an equal amount of 6-8-0 of 76 pounds of seed cotton per acre. In those days we were getting 17 and 18 cents a pound for lint cotton and $30 a ton for seed, so 7 cents a pound was a fair price for seed cotton. On that price basis, the addition of 24 pounds of potash, costing $1.20, to the fertilizer mixture gave an increased yield valued at $5.32—a profit of $4.12 an acre. Equally profitable results were secured by the use of 600 pounds per acre of 6-8-8. The dollar the farmer spent for potash in the spring returned at the fall harvest with four others just like it.

For some reason, the series of tests made in East Texas during 1930 failed to include unfertilized check plots, so no comparison can be made between cotton fertilized with and without potash. However, the use of 600 pounds per acre of 6-8-8 produced an increase of 39 pounds of seed cotton as compared to an equal amount of 6-8-4. This would give a small profit with cotton at a fair price.

Results in 1931 are particularly interesting because they show what potash can do in the face of 6-cent cotton. That year, the use of 400 pounds of 6-8-4 brought an increase in yield over an equal amount of 6-8-0 of 88 pounds of seed cotton per acre. When the amount of potash was doubled, the increase in yield practically doubled. In spite of a low price of 2½ cents a pound for seed cotton (equivalent to

Sandy loam soil on the farm of H. R. White, Henderson, Texas
Left: 600 lbs. 6-8-8 per A. Right: No fertilizer
The yield on the 6-8-8 plat was 915 lbs. of seed cotton per A.

6 cents for lint and $15 a ton for seed) a dollar invested in potash brought back two dollars in increased yield.

Variation in test methods from year to year make it inadvisable to attempt to compile three-year averages covering this work. It is enough to say, however, that the use of 16 to 32 pounds of potash per acre in a 1½-2-1 or 1½-2-2 ratio with nitrogen and phosphoric acid gave a satisfactory profit regardless of a variation of 300 per cent in the price of cotton during the three-year period.

Results secured by N. V. Potash are pretty well borne out by tests made at the East Texas substations of the Texas Experiment Station. The work over a period of five years shows a very definite response to potash on soils that 10 or 15 years before gave almost negative results. Perhaps most outstanding has been the response at College Station on Lufkin fine sandy loam where the use of 16 pounds of potash per acre meant the difference between a $2.58 loss (without potash) and a profit of $2.74.

More Potash for Rust and Wilt

In all sections of East Texas, except the Coastal Prairie, farmers are getting very satisfactory results from 400 to 500 pounds of 4-6-4 or 4-8-4, and higher grade materials with a similar plant-food ratio. Of course, where cotton must contend with rust and wilt, and these diseases are becoming increasingly common, considerably larger applications of potash and a higher potash ratio are in order.

Potash top-dressing has been tried to only a limited extent in Texas. In the three years' work under Carroll and Tanner, definite response was obtained from top-dressing in those cases where insufficient potash was used under the crop, and when summer drouth did not arrive too early. However, there was no indication that potash top-dressing was needed when a reasonable amount of potash was used under the crop. In using fertilizers, Texas farmers must contend with dry weather that some years begins as early as the last of May and continues for many weeks. When this happens, top-dressings are of little value. In fact, the probability of dry weather makes potash top-dressing hazardous. Certainly it is much less certain of success in East Texas than in our eastern cotton areas where summer rainfall is not only more regular but more abundant.

In the Other States

The soils of the other States of the Southwest are showing a marked response to potash when used on general field crops. In Louisiana, potash deficiency is quite often the limiting factor in crop production. Certain soils in that State are so deficient in potash that when this plant food is eliminated, crops are practically a failure. All the soils in the State respond to potash fertilization, except the alluvial soils along the Mississippi and Red Rivers. For cotton, from 36 to 48 pounds of potash along with 24 to 30 pounds of nitrogen and 24 to 72 pounds of phosphoric acid are recommended.

In Arkansas, from 4 to 6 per cent potash in a complete fertilizer is advisable for cotton in all areas where the crop is grown. On soils where cotton rust and wilt are prevalent, higher percentages of potash should be used.

The response that the soils of this section are now showing to potash does not mean that the recommendations of 10 or 15 years ago were inaccurate. They were undoubtedly sound for the time in which they were made. Texas is merely following the path of fertilizer experience that has been trod by other States. The writer can remember when certain potash-loving crops were grown successfully on Mississippi soils without potash.

At one time the great majority of Southern soils contained large amounts

(*Turn to page* 26)

Soil Fertility Display, Experimental Union Annual Meeting, Agricultural College, Guelph, Ontario
Pasture Fertilization — Rooting Studies and Plant Solutions — The Necessity of a Fertility Balance

A Soil Exhibit Carrying a Story

By Henry G. Bell

Associate Professor of Chemistry, Ontario Agricultural College

FARMERS today, for obvious reasons, are vitally interested in the economics of their occupation. Farming must go on, and crops must be raised. Not only this, but crops must be raised more efficiently.

To this end, the farmers that gathered at the last convention of the Ontario Experimental and Agricultural Union, held at Ontario Agricultural College, were particularly interested in an exhibit put on by the Department of Chemistry which brought to light some very definite points regarding crop growth. In this exhibit six crops —corn, wheat, barley, beans, peas, and tomatoes—were grown in solutions. One solution contained plant food simulating that found in a medium rich soil. The second series contained all but nitrogen; the third all but phosphoric acid; and the fourth all but potash. One objective of the exhibit was to illustrate the functions of the plant nutrients by their absence.

For instance, the series without nitrogen but with all the other plant-food constituents, when compared with the series containing complete plant food, showed quite definitely the function of nitrogen. Much greater stalk and leaf growth and a much more healthy and vigorous growth of root were found in all of the complete plant food jars than were found on the same crops in jars wherein deficiencies of plant food existed.

(*Turn to page* 30)

The Inquiring Mind *and the* Seeing Eye

By Dr. A. S. Alexander

University of Wisconsin

THE late Milton Whitney, D.A., who was Chief of the Bureau of Soils of the U. S. Department of Agriculture from the time of its organization in 1894 until June 1927, should be given credit and appreciation for devising and carrying into effect many of the plans and specifications upon which were founded and built the science to which he devoted his life with admirable enthusiasm, purpose, and industry.

A prodigious worker himself, he brought to his assistance younger men of ability and thorough training with whom he conferred daily and to whom he allotted the work of trying out his far-seeing ideas, developing those found worth while, and eventually having them applied to practice in soil management for commercial purposes. In this work he likewise spent long days of personal labor, many of them carried into the "wee, sma' hours ayont the twelve," and never for a moment did he relax his thinking and his efforts in the search for mastery of his subject.

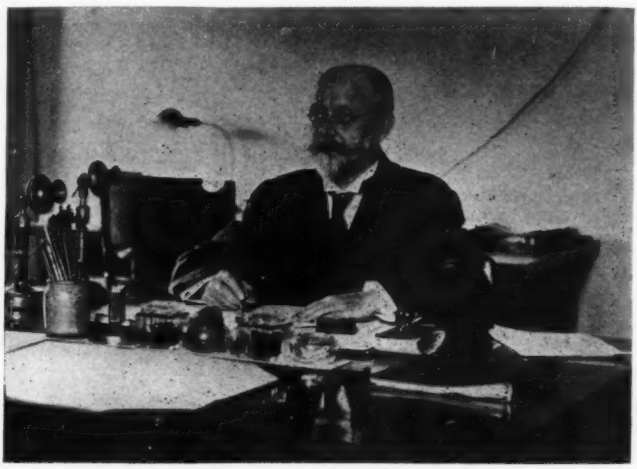
Like Dr. H. J. Patterson, of whom we wrote in the June-July number of this magazine, Milton Whitney assumed with his colleagues a paternal rather than a domineering attitude, and so by efficient and kindly team work, attained results which were highly satisfactory and eminently useful. To them, he was an able guide and inspiring leader. While he may have appeared somewhat austere in manner, he was but trying to maintain the dignity of his position, and in fact was genial at heart. As age brought experience and a more intimate knowledge of men, he became less exacting and more gracious in mien and manner. When entrusting a young assistant scientist with an idea and receiving one from him in return, he would say, in a fatherly fashion: "Son, let us look at this thing from every view-point, test it in every way, and then decide whether it has merit and is worth developing." And so as a family matter, ideas materialized into facts, and they, in turn, into helpful hints and instructions for the guidance of workers on the land.

Beloved by Co-workers

A. H. Snyder of the University of Maryland, who did research work for a time in the Bureau of Soils, tells me that Dr. Whitney fitted up a small laboratory in his home at Takoma Park, Washington, where he worked at night. There he did a considerable amount of research, aided by some of his assistants, that resulted in the identification of many organic compounds in the soil, some beneficial, some toxic, and some inert in their effect on plants. There, too, he spent many an evening talking over the results obtained during the day and making plans for future work. In that way there grew up between the Chief and his co-work-

ers a bond of sympathy and understanding which bore fruit in unselfish devotion to the work in hand and to its successful consummation in notable achievements.

In the laboratories of the Bureau, he kept in close touch with the workers and their engagements; but there was no "pussyfooting" in his almost daily tours of inspection. So thoughtful was he, indeed, of the feelings of his "Sons" that, according to Dr. Henry G. Knight, present Chief of the Bureau of Soils, he always jingled a bunch of keys on their ring in his pocket, so that his approach never was unannounced.



Dr. Milton Whitney

He was of a rather precise turn of mind and intensely methodical; always at his desk before the opening of the office, and seldom away from the Bureau. Never taking a real vacation, it was a most important event that succeeded in luring him from Washington. Promptly at nine o'clock, nearly every morning, he would call for some one of his assistants to discuss a problem in which he was especially interested and to which he had given thought over night. He made no important decisions without a conference with other members of the Bureau; but having arrived at a conclusion, he was almost adamant in adhering thereto.

Naturally Dr. Whitney, being so fully and usefully employed, had little time for hobbies; yet we are told that he immensely enjoyed a fishing trip, was an ardent philatelist, possessed at one time of a splendid collection of stamps, and had such a genuine love of fine tools that a visit to his home usually included an excursion to the basement for an exhibition and demonstration in his splendidly equipped little work shop.

It was not strange that he took a keen interest in the raising of fine tobaccos and did much to further the interests of the tobacco growing industry, for we are informed by Dr. Knight that he was an inveterate smoker, seldom seen at any time without a cigar, and never averse to enjoyment of the fragrant weed by the members of his staff. It is reported that to arouse Dr. Whitney's ire one had only to propose the establishment and enforcement of a rule to ban smoking in the Bureau offices. To that license, perhaps, may be attributed the fact that those of his close associates who still work in the Bureau retain the cigar-smoking habit and disdain the more effeminate cigarette.

Dr. Whitney was an inspiration and sound counsellor to many a soils scientist who worked with him in the Bureau and he gained their esteem and admiration, although their ideas might not always coincide. Of these may be mentioned James M. Bell, Head of the Department of Chemistry of the University of North Carolina; Dr. Lyman K. Briggs, Chief of the Bureau

of Standards; Dr. Frank K. Cameron, Professor of Chemistry of the University of North Carolina; E. E. Free, former editor of *The Scientific American;* the late Professor F. H. King of the University of Wisconsin; W. J. McGee, geologist and soil expert; the late R. B. Moore, eminent helium and radio activity expert; W. H. Stevenson, Head of the Soils department of Iowa State College; and Professor A. R. Whitson, Chairman of the Department of Soils of the University of Wisconsin.

Early Life in Maryland

Milton Whitney came of an old Maryland family. He was born in Baltimore, August 2, 1860, the son of Milton and Anne M. Whitney. His father was at one time State Attorney for Baltimore City. Young Whitney spent his boyhood days at the family home on the banks of the Severn, in Anne Arundel county, and received his early education in the schools of Baltimore. Later, a three years' course of special work in chemistry at Johns Hopkins University, under the direction of Dr. Ira Remsen, inspired him to devote his attention to the study of soils and their relation to plant growth.

Finishing his studies at Johns Hopkins in 1883, he was made assistant chemist of the Connecticut Agricultural Experiment Station, where he gained experience and proficiency. From 1886 to 1888, he was superintendent of the experimental farm of the North Carolina Experiment Station, and acquired much practical experience in the handling of soils which proved of great value to him in his later scientific studies. It was in the report of his work at this station that he first called attention to the profound influence of the physical properties of soils upon crop production. On leaving North Carolina, he became Professor of Agriculture in the University of South Carolina, and also Director of the Agricultural Experiment Station. Serving there until 1891, he was appointed Soil Physicist of the Maryland Agricultural Experiment Station, where he did useful work and remained until 1894.

On June 30, 1891, he had married Annie C. Langdon, daughter of a prominent member of the Episcopal clergy. Of this marriage there came a family of four sons and one daughter, forming a home circle where culture and happiness reigned.

While Dr. Whitney was working at the Maryland Experiment Station, the Weather Bureau of the U. S. Department of Agriculture placed funds at his disposal enabling him to complete a full report on soil investigations. This report was published as Weather Bulletin No. 4. The U. S. Department officials were so impressed with the necessity for study of the great problems of the soil, as set forth in the bulletin that they established a Division of Soils in 1894, and selected Whitney as its head. Under his efficient management, the work of the new Division grew apace, and in 1910 Congress established it as a Bureau with him as Chief. Under his guidance, the Bureau expanded greatly and soon undertook many lines of investigation.

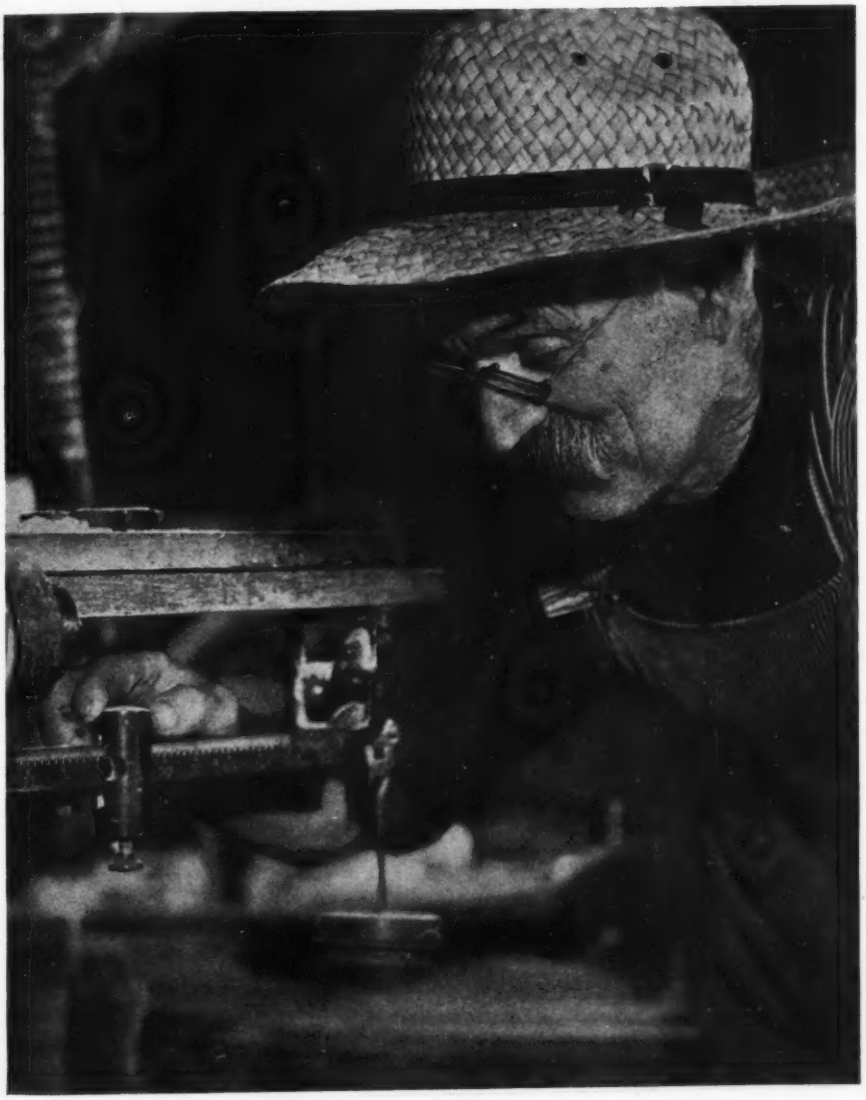
Initiated Soil Surveys

One of the most notable achievements of the Chief was the establishment of the Soil Survey, which had as its objective the mapping of the soil types of the entire United States. This useful organization, thanks to the enterprise of Dr. Whitney and that of many eminent men who joined enthusiastically in its furtherance, quickly proved of inestimable value, and in time more than one-third of the arable lands of the United States had been mapped, to show the location and extent of the various types of soil.

Another notable investigation, conceived and carried out under the direction of Dr. Whitney, was the study of the alkali problem of the Western lands. As a result there was devised a method for the reclamation and handling of such soils which has

(*Turn to page* 28)

Pictorial



HONEST MEASURE

Above: A general view of one of Long Island's many estate gardens, showing several unemployed families at work raising fruits and vegetables. Many of the Empire State's millionaires have donated the use of their estates, and more than 160,000 such gardens are being worked by unemployed men.

Left: "Weep no mo, mah baby, de price of cotton is going up."

Right: Some swill, and not the Emergency Hog Marketing Program, is this porker's chief worry.

Below: Part of the delegation of 2,211 New York farmers who visited the Century of Progress — Chicago World's Fair—in four special trains chartered by the New York division of the American Farm Bureau Federation. It was the largest, long-haul excursion trip in the history of the N. Y. Central Lines.

Left: The center row shows what happened in an Indiana wheat field when the drill, distributing a 2-12-6 fertilizer, clogged.

Below: Four fine silos guarantee that the herd on this Connecticut dairy farm will receive plenty of succulent feed during the long winter months.

The Editors Talk

Fertilizers Go West

The World's Grain Exhibition and Conference was held at Regina in the Province of Saskatchewan, Canada, from July 24 to August 5. Included in the attendance were representatives of many countries of Europe, South America, and Asia. In conjunction with the Exhibition and Conference, the Canadian Society of Technical Agriculturists held its Thirteenth Annual Convention and the Canadian Seed Growers held their meetings previous to the conference.

In addition to the excellent exhibits of grains entered into judging competition, conferences were held every day at the Regina College. Such conferences covered a wide range of subject matter, as did the open sessions which took place at the Armory every morning. For instance, on Wednesday, ten papers were given on cereal breeding, eight on agricultural engineering problems, five on rice breeding and production, nine on soil classification and fertilizers, four on economic problems, three covered the organization and control of grasshopper campaigns, and four on meteorology. All these papers were given on the same day and the programs on the other days covered equally as large a range of matters. It was noticeable, however, that no matter how varied or how diverse the treatment of the subject, the various papers could nearly all be related to an increasing emphasis on efficiency in farm operation. Much as we may dislike being compelled to become more efficient, there is no escaping the handwriting on the wall. And it is being written very plainly.

Among the factors making for efficiency is a better knowledge of soils and the proper use of fertilizers. Not long ago the great Prairies of Western Canada were considered among the most fertile soil areas in the world; and yet the use of fertilizers in this area during recent years has received increasing attention. In line with this increasing pressure, five papers were given under the general heading of Fertilizers. Professor E. Truog of Wisconsin started the section with a paper on "Determining the Fertilizer Needs of the Soil by Chemical Analysis." This was followed by a very interesting account of the "Rothamsted Experiments on the Growth of Wheat" by Sir John Russell, the well-known Director of the Rothamsted Experiment Station.

The role of micro-organisms in relation to soil nitrogen the role of nitrogen in wheat production, and the possibilities in the use of nitrogen on small grains and grasses were discussed by other speakers. At another time under the heading of Soil Classification and Fertilizers nine papers were given which brought out the fact that there is a great variability even in the soils of the Prairie regions. So far, for instance, in the Province of Saskatchewan, 110 distinct soil types making up 22 distinct soil series have been mapped. This variability of soil type, even in what is considered the richer soil regions, indicates the necessity of regional and local studies if fertilizers are to be used profitably and efficiently in crop production.

Along the same line it is noted in the News Letter by the Canadian Government, under date of September 2, that there is a growing use of fertilizers

in Canada. Investigational work with fertilizers is carried on by the Canadian Government Experimental Farm System at its branch farms and stations, situated in every province of the Dominion. It has been found that for the majority of crops the use of a complete fertilizer mixture—one furnishing nitrogen, phosphoric acid, and potash—is best, especially in Eastern Canada and in British Columbia. To supply this fertilizer there were 60 plants engaged in making mixed fertilizers and fertilizer materials in Canada in 1932, the output of which totaled 256,633 tons. Some of this fertilizer is now being used in the Prairie Provinces where it not only has increased the yield of wheat but has matured it earlier and decreased the percentage of weeds. This is being demonstrated in a great many areas.

But in addition to a growing emphasis on efficiency, another note was sounded at the conference. It was the urgent need for the development of character, individualism, and color in rural life. Efficiency alone is apt to be a hard task-master in achieving the benefits and material profits from the growing emphasis for a more efficient agriculture. The larger problem is to conserve at the same time a vigorous character and individualism. After all it is quite possible that this is the modern problem the world over.

We Have a Birthday

With this issue our publication passes the 10-year mark of its existence. Before saying anything further, we want to thank most cordially our contributors and readers, many of them scientists of not only national but international reputation, for their fine cooperation and interest which have helped the publication find and keep its place among agricultural journals. Without such cooperation, we could not have maintained the magazine during the trying years through which the agricultural press along with agriculture is passing.

BETTER CROPS was started in September 1923, not as a farm paper, but as a journal to be edited particularly for county agricultural agents, advisers on soils and fertilizers, agronomists, experiment station workers, State and Federal bureau members, and heads of cooperative societies. It was proposed to provide these agricultural groups with thoroughly authoritative information, particularly on crop production problems, which they might not run across in other publications, and to present this material in an attractive and easily-read form. The size was made to fit the pocket or take up little space on the desk, in other words, a Pocket Book of Agriculture.

In June 1927, BETTER CROPS was combined with PLANT FOOD, which came into print in January 1926. The mission of the two magazines had been virtually identical. The first issue was dedicated to the far-seeing and untiring work of the county agricultural agents in building a permanent basis for our national agriculture.

While agriculture has been and still is going through its hardest years, we still maintain that the work of the agricultural scientist is just as important as it ever was. The steadfast interest of our readers and contributors, in turn, leads us to believe that the service which we have striven to give them in our publication has been appreciated and that our earnest desire to contribute our small part toward the betterment of agriculture has, in some measure, been achieved.

We go on from here with the same aims and purposes and the sincere hope that we may continue to have the fine support of our contributors and readers.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, and Crops. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Potash fertilizers have been found to exert a favorable influence on the quality of cotton seed by J. F. O'Kelly, W. W. Hull, and M. Geiger. The results of their work have recently appeared in Mississippi Agricultural Experiment Station Technical Bulletin No. 20, "Effects of Varying Amounts of Potash on Oil and Protein and on the Weight and Percentage of Cotton Seed." The authors believed that the effects of fertilization on the quality of the seed tended to be overlooked in favor of the more important factor of lint yield. They found that a nitrogen and phosphoric acid fertilizer decreased the oil content of the seed, while the addition of potash increased the oil content, more or less in proportion to the potash added. Since the potash also increased the yield per acre of cotton seed, the increase in oil per acre was considerable.

Potash decreased the percentage protein of cotton seed, but increased the yield per acre of seed so much that there was a greater total yield of protein per acre when potash was used than when it was not used. Potash increased the weight of the seed and tended to decrease the seed percentage. However, the latter influence was not consistent, and is not considered significant from these results. From this work it is evident that where potash increases the yield of lint cotton, it also improves the quality of the cotton seed.

The bad features connected with lodgings of corn are so well known that they need no discussion. It is therefore of obvious importance to investigate the factors favoring lodging and from this develop ways and means of reducing this trouble. N. A. Pettinger reports on his investigation of this problem in the Virginia Agricultural Experiment Station Technical Bulletin No. 46, "The Effect of Fertilizers, Crop Rotation, and Weather Conditions on the Anchorage of Corn Plants." The number of stalks that were lodged was counted and the root development or anchorage was measured by the force necessary to pull out the roots. The data obtained showed that fertilization was an important factor in connection with lodging and anchorage. The soil was deficient in all three nutrients—nitrogen, phosphoric acid, and potash. Nitrogen fertilizers when used with potash increased the anchorage slightly, but when used alone decreased it. Phosphoric acid fertilizers, especially superphosphate, markedly improved root anchorage, while potash fertilizers greatly improved anchorage. Potash, of the three elements, exerted the greatest improvement, but best all-round results were obtained on this soil when a complete fertilizer was used. The author points out that the fertilizer exerting the most favorable influence will naturally vary with soil conditions.

Comparing anchorage of corn grown continuously on the same ground with corn grown in a rotation with wheat

and hay, the author found that the corn grown in the rotation had a much better root anchorage. Weather naturally exerted quite an influence on lodging of corn, rain and wind together causing the most damage. In years of lower rainfall, wind was not so important a factor in causing lodging.

Of interest to investigators will be the extensive and well-selected bibliography included in the bulletin.

"The Effect of Variations in the Nutrient Media upon the Nitrogen, Phosphorus, and Potassium Content on Plants with Special Reference to the Tomato," Agr. Exp. Sta., Fayetteville, Ark., Bul. 288, June, 1933, R. P. Bartholomew, V. M. Watts, and George Janssen.

"The Availability of Phosphatic Fertilizers," Agr. Exp. Sta., Fayetteville, Ark., Bul. 289, June, 1933, R. P. Bartholomew.

"Analyses of Commercial Fertilizers," Agr. Exp. Sta., Lexington, Ky., Bul. 325, Dec., 1931, H. E. Curtis, H. R. Allen, and Lelah Gault.

"Registration, Labeling, Inspection, and Sale of Commercial Fertilizer; 1932," Agr. Exp. Sta., Columbia, Mo., Bul. 321, Mar., 1933, F. B. Mumford and L. D. Haigh.

"Fertilizer Experiments on 'Run-Out' Hay Land," Agr. Exp. Sta., Durham, N. H., Bul. 271, Apr., 1933, Ford S. Prince, Paul T. Blood, T. G. Phillips, and G. P. Percival.

"Retail Prices of Fertilizer Materials and Mixed Fertilizers," Agr. Exp. Sta., Ithaca, N. Y., Bul. 545, Nov., 1932, E. E. Vial.

"Fertilizer Report, 1932," Dept. of Agr., Harrisburg, Pa., Gen. Bul. 518, Aug. 1, 1933, James W. Kellogg.

"Mechanical Application of Fertilizers to Cotton in South Carolina, 1931," U. S. D. A., Washington, D. C., Cir. 264, Apr., 1933, G. A. Cummings, A. L. Mehring, J. J. Skinner, and Ward H. Sachs.

"Use of the Exponential Yield Curve in Fertilizer Experiments," U. S. D. A., Washington, D. C., Tech. Bul. 348, Apr., 1933, W. J. Spillman.

Soils

Practical and up-to-date suggestions on how to fertilize and lime muck and dark sandy soils so as to get the best results are given by S. D. Conner in Purdue University Agricultural Extension Leaflet No. 179, "Treatment of Muck and Dark Sandy Soils." After a brief discussion of the physical and chemical differences among various muck soils, the appropriate uses of lime on acid soils, and of sulfur on alkaline soils, are given. The importance of fertilizers is stressed, in which the author brings out that the fertility of the soil will be very quickly depleted by intensive cropping, unless proper fertilizers are used. He states that potash is usually the fertilizer element most needed on these classes of Indiana soils, followed by phosphate, while nitrogen is of lesser importance. Manure can be used with good results, but the weed problem, usually troublesome on mucks, is likely to be made worse by it. The analyses most suitable for use on muck are given as 0-8-32, 0-8-24, 0-10-20, 0-20-20, 2-8-16, and 3-9-18. The analyses to use and the amount per acre to apply will depend on the soil, crop, and previous treatments. For dark sandy soils, 0-20-20, 0-12-12, 0-8-16, and 0-14-6 fertilizers are suggested. In cold wet seasons, nitrogen fertilizers may be added. The place of the minor elements such as copper and manganese in fertilizing soils is also mentioned. The suggestions contained in this leaflet will be found helpful to all farmers on muck and dark sandy soils.

There is an increasing demand for information on the fertilizer needs of specific soils or fields, and to fill this need, several excellent publications and methods of testing have recently appeared. A worthy addition to this group is S. F. Thornton's recent bulletin, "A Simple and Rapid Chemical Test on Plant Material as an Aid in Determining Potassium Needs" (Purdue University Agricultural Experiment Station Bulletin No. 384.) The author uses the plant as a basis for determining the soil's need for potash. He describes plant appearances which are characteristic of an acute shortage of potash. In order to ascertain the potash needs of soils before this acute shortage develops, Thornton has devised a test whereby an appropriate portion of the plant is tested for potash by a comparatively simple chemical

test. If the plant shows only a small amount of potash, it is assumed the soil lacks available potash; while if the plant shows a large amount of potash present, the soil is considered to be well supplied with this nutrient. Yield data from experimental fields are correlated with the test results and indicate a practical reliability for the test.

"Effects of Inoculation and Liming on Soybeans Grown on the Grundy Silt Loam," Agr. Exp. Sta., Ames, Iowa, Bul. 298, Apr., 1933, R. H. Walker and P. E. Brown.

"The Winogradsky Spontaneous Culture Method for Determining Certain Soil Deficiencies," Agr. Exp. Sta., Ames, Iowa, Res. Bul. 157, Apr., 1933, Arthur W. Young.

"Soils of Toole and Liberty Counties," Agr. Exp. Sta., Bozeman, Mont., Bul. 273, Apr., 1933, L. F. Gieseker.

"Soils of Glacier County," Agr. Exp. Sta., Bozeman, Mont., Bul. 274, Apr., 1933, L. F. Gieseker.

"Proceedings of the New Jersey Land Use Conference Held at New Brunswick, N. J., December 21, 1932," Agr. Exp. Sta., New Brunswick, N. J., Bul. 552, Jan., 1933.

"Some Facts About Soil Management in a New York Orchard," Agr. Exp. Sta., Geneva, N. Y., Bul. 629, June, 1933, R. C. Collison and J. D. Harlan.

"The Buffer Capacity of Peat Soils," Agr. Exp. Sta., Ithaca, N. Y., Mem. 146, Mar., 1933, B. D. Wilson and M. J. Plice.

"Soil Survey of The San Luis Obispo Area, California," U. S. D. A., Washington, D. C., Series 1928, No. 29, E. J. Carpenter and R. Earl Storie.

"Soil Survey of The Gooding Area, Idaho," U. S. D. A., Washington, D. C., Series 1929, No. 10, F. O. Youngs, Glenn Trail, and B. L. Young.

"Soil Survey of The Rincon Area, New Mexico," U. S. D. A., Washington, D. C., Series 1930, No. 5, A. T. Sweet and E. N. Poulson.

"Soil Survey of Suffolk and Nassau Counties, New York," U. S. D. A., Washington, D. C., Series 1928, No. 28, Clarence Lounsbury, F. B. Howe, R. E. Zautner, W. J. Moran, and P. D. Beers.

Crops

The 1933 Yearbook of Agriculture of the United States Department of Agriculture has recently been put into circulation. In the foreword its editors, Milton S. Eisenhower and Arthur P. Chew, point out that this Yearbook differs somewhat in form and content from those issued for the last six years. "It condenses the latest scientific achievements of the United States Department of Agriculture in the Secretary's annual report to the President instead of giving them extended treatment in articles by individual specialists. Space thus becomes available for describing the agricultural effects of the depression and for summarizing recent developments in farm practice." All who in the past have found the Yearbooks of much interest and great value as a source of information on our major industry will wish to obtain as soon as possible this new issue.

"Please Keep Me For Reference" is the by-line on the cover of Bulletin No. 97, "A Hand Book of Agronomy (Field Crops, Lime, Fertilizer, Soils)" which has been prepared and distributed by the Agronomy Department of the Virginia Agricultural and Mechanical College and Polytechnic Institute. There is little doubt that this publication will be kept for reference by anyone into whose hands it falls. The wealth of information contained in the publication is divided into two parts: Part 1, Crops; Part 2, General Information. In true hand-book style, the important facts for success with the various crops which can be grown in Virginia are concisely tabulated for easy and rapid reference.

"Proceedings Sixty-fifth Convention of California Fruit Growers and Farmers, Ventura, California, December 7, 8, and 9, 1932," Dept. of Agr., Sacramento, Cal., Mo. Bul., Vol. XXII, No. 1, Jan., 1933.

"Thirteenth Annual Report California Department of Agriculture for the Period Ending December 31, 1932," Dept. of Agr., Sacramento, Cal., Mo. Bul., Vol. XXI, No. 12, Dec., 1932.

"Growing Alfalfa in Colorado," Agr. Col., Fort Collins, Colo., Ext. Bul. 329-A, Feb., 1933, Alvin Kezer.

"Pyrethrum Investigations in Colorado," Agr. Col., Fort Collins, Colo., Bul. 401, July, 1933, C. B. Gnadinger, L. E. Evans, and C. S. Corl.

"Studies on Changes in Vitamin Content of Alfalfa Hay," Agr. Col., Fort Collins, Colo., Tech. Bul. 4, May, 1933, Earl Douglass, J. W. Tobiska, and C. E. Vail.

"Report of the Director for the Year Ending October 31, 1932," Agr. Exp. Sta., New Haven, Conn., Bul. 347, Mar., 1933, Wm. L. Slate.

"Report of the Director for the Year Ending June 30, 1932," Agr. Exp. Sta., Storrs, Conn., Bul. 181, Sept. 1932, Wm. L. Slate.

"Potatoes," Agr. Exp. Sta., Storrs, Conn., Bul. 183, Apr., 1933.

"Tobacco Substation at Windsor—Report for 1932," Agr. Exp. Sta., New Haven, Conn., Bul. 350, Apr., 1933, T. R. Swanback, O. E. Street, and P. J. Anderson.

"Herbaceous Perennials," Agr. Ext. Serv., Gainesville, Fla., Ext. Bul. 76 (A Revision of Bul. 57), May, 1933, John V. Watkins.

"Forty-fifth Annual Report for the Year 1932," Ga. Exp. Sta., Experiment, Ga., H. P. Stuckey.

"Report of the Director July 1, 1931, to June 30, 1932," Purdue Univ., Lafayette, Ind., J. H. Skinner and T. A. Coleman.

"Korean and Other Lespedezas," Purdue Univ., Lafayette, Ind., Ext. Leaflet 175, May, 1933, K. E. Beeson.

"Celery Growing," Purdue Univ., Lafayette, Ind., Ext. Leaflet 178, May, 1933, W. B. Ward.

"Raspberries and Blackberries," Purdue Univ., Lafayette, Ind., Ext. Bul. 191, Apr., 1933, Clarence E. Baker.

"Sixth Biennial Report of the Director for the Biennium July 1, 1930, to June 30, 1932," Agr. Exp. Sta., Manhattan, Kan., Dec., 1932, L. E. Call.

"The Forty-fifth Annual Report of the University of Maryland, 1931-1932," Agr. Exp. Sta., College Park, Md., H. J. Patterson.

"Annual Report for the Fiscal Year Ending November 30, 1932," Agr. Exp. Sta., Amherst, Mass., Bul. 293, Mar., 1933, F. J. Sievers.

"Potato Growing in Massachusetts," Mass. State Col., Amherst, Mass., Ext. Leaflet No. 20, Feb., 1933, Ralph W. Donaldson, Oran C. Boyd, and Arthur I. Bourne.

"Success with House Plants," Mass. State Col., Amherst, Mass., Ext. Leaflet No. 103, Feb., 1933, A. M. Davis and C. L. Thayer.

"Pasture Plants and Pasture Combinations," Univ. of Minn., St. Paul, Minn., Ext. Cir. 40, Mar., 1933, Ralph F. Crim and A. C. Arny.

"Modern Bush Fruit Growing," Agr. Exp. Sta., St. Paul, Minn., Spec. Bul. 79 (Rep.) Feb., 1932, Franc P. Daniels.

"Forty-sixth Annual Report of the Agricultural Experiment Station of Nebraska," Agr. Exp. Sta., Lincoln, Neb., Feb. 1, 1933, W. W. Burr.

"Winter Wheat Varieties in Nebraska," Agr. Exp. Sta., Lincoln, Neb., Bul. 283, July, 1933, T. A. Kiesselbach, Arthur Anderson, and C. A. Suneson.

"Permanent and Temporary Pastures for Nebraska," Agr. Exp. Sta., Lincoln, Neb., Ext. Cir. 102 (Rev.) June, 1933, P. H. Stewart and D. L. Gross.

"Corn in Nebraska," Agr. Exp. Sta., Lincoln, Neb., Ext. Cir. 136, Apr., 1933, P. H. Stewart, D. L. Gross, and T. A. Kiesselbach.

"The Home Orchard and Fruit Garden," Agr. Exp. Sta., Lincoln, Neb., Ext. Cir. 1231, June, 1933, E. H. Hoppert.

"New Jersey Standard for Classifying the Set of Fruit Buds Upon Peaches," Agr. Exp. Sta., New Brunswick, N. J., Cir. 271, Mar., 1933, M. A. Blake.

"Classification of 135 Varieties and Species of Peaches and Nectarines on Basis of Fruit Bud Set at New Brunswick," Agr. Exp. Sta., New Brunswick, N. J., Cir. 274, Mar., 1933, M. A. Blake.

"The Home Vegetable Garden," Agr. Exp. Sta., State College, N. M., Ext. Cir. 126, Mar., 1933, H. C. Stewart.

"4-H Vegetable Growing," State Col. of Agr., Cornell Univ., Ithaca, N. Y., Cornell Jr. Ext. Bul. 46, Feb., 1933, Arthur J. Pratt.

"Cut-flower Production under Cloth," State Col. of Agr., Cornell Univ., Ithaca, N. Y. Cornell Ext. Bul. 252, Feb., 1933, Kenneth Post.

"Studies of Potato Storage," Agr. Exp. Sta., Ithaca, N. Y., Bul. 553, Mar., 1933, Ora Smith.

"Some Carbohydrate Changes in Shelled Green Peas," Agr. Exp. Sta., Geneva, N. Y., Bul. 622, Mar., 1933, Z. I. Kertesz.

"Notes on the Species of Apples—I. The American Crabapples," Agr. Exp. Sta., Geneva, N. Y., Tech. Bul. 208, Feb., 1933, G. P. Van Eseltine.

"Chromosome Numbers in Aneuploid Apple Seedlings," Agr. Exp. Sta., Geneva, N. Y., Tech. Bul. 209, Mar., 1933, B. R. Nebel.

"Relation of Hydrogen-ion Concentration to the Growth of Onions," Agr. Exp. Sta., Ithaca, N. Y., Mem. 145, Dec., 1932, A. L. Wilson.

"The Culture of Flue-cured Tobacco in North Carolina," Dept. of Agr., Raleigh, N. C., Jan., 1933, E. G. Moss and Jas. F. Bullock.

"House Plants," Ohio State Univ., Columbus, Ohio, Ext. Bul. 132, Sept., 1932, Irwin Klein.

"Grape Growing in Ohio," Ohio State Univ., Columbus, Ohio, Ext. Bul. 135, Oct., 1932, C. S. Holland.

"Flower Growing," Agr. Exp. Sta., Wooster, Ohio, Bul. 535, June, 1933, Alex Laurie, V. H. Ries, L. C. Chadwick, and G. H. Poesch.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XVIII, No. 163, July-August, 1933.

"Cotton Experiments at the Lawton (Oklahoma) Field Station 1916-1931," Agr. Exp. Sta., Stillwater, Okla., Sta. Bul. 209, Mar., 1933, W. M. Osborn.

"Sorghums for Grain and Forage," Agr. Exp. Sta., Stillwater, Okla., Sta. Bul. 210, Feb., 1933, B. F. Kiltz, John B. Sieglinger, W. M. Osborn, B. F. Barnes, and H. H. Finnell.

"Growth and Yield in Oak Forests of Pennsylvania," Agr. Exp. Sta., State College, Pa., Bul. 283, Mar., 1933, A. C. McIntyre.

"Varieties of Corn for Central Pennsylvania," Agr. Exp. Sta., State College, Pa., Bul. 289, May, 1933, C. F. Noll and C. J. Irvin.

"The Management of Filler Apple Trees," Agr. Exp. Sta., State College, Pa., Bul. 290, May, 1933, F. N. Fagan.

"American Potato Journal," The Potato Assn. of America, Lancaster, Pa., Vol. X, No. 6, June, 1933.

"Annual Report Rhode Island State College Extension Service 1932," *State Col., Kingston, R. I., Ext. Bul.* 63, *Apr.,* 1933, *G. E. Adams.*

"Crop Yields Over Nineteen Years from Highmore Experiment Farm," Agr. Exp. Sta., Brookings, S. D., Bul. 272, *July,* 1932, *A. N. Hume.*

"Jersey Redskin: A Fall-crop Irish Potato," Agr. Exp. Sta., Knoxville, Tenn., Bul. 148, *May,* 1933, *Brooks D. Drain.*

"Balbo Rye," Agr. Exp. Sta., Knoxville, Tenn., Cir. 45, *July,* 1933, *C. A. Mooers.*

"Forty-fifth Annual Report 1932," *Agr. Exp. Sta., College Station, Tex., A. B. Conner.*

"Vitamin A Content of Foods and Feeds," Agr. Exp. Sta., College Station, Tex., Bul. 477, *July,* 1933, *G. S. Fraps and Ray Treichler.*

"Growing Asparagus," A. & M. Col. of Tex., College Station, Tex., Ext. C-82, 1933, *J. F. Rosborough.*

"Watermelon Demonstration," A. & M. Col. of Tex., College Station, Tex., Ext. C-87, 1933, *R. R. Reppert.*

"Important Steps in Growing Cotton," A. & M. Col. of Tex., College Station, Tex., L-6, 1933, *E. A. Miller.*

"Important Steps in Growing Peanuts," A. & M. Col. of Tex., College Station, Tex., L-11, May, 1932, *E. A. Miller.*

"Information for Virginia Fruit Growers," A. & M. Col., Blacksburg, Va., Ext. Bul. 131, *Feb.,* 1933.

"Some Accomplishments in 1932," *A. & M. Col., Blacksburg, Va., Ext. Bul.* 132, *Mar.,* 1933, *John R. Hutcheson.*

"Department of Agriculture-Immigration of Virginia," Bul. 305, *June,* 1933, *Dept. of Agr., Richmond, Va.*

"Department of Agriculture-Immigration of Virginia," Bul. 306, *July,* 1933, *Dept. of Agr., Richmond, Va.*

"Department of Agriculture-Immigration of Virginia," Bul. 307, *Aug.,* 1933, *Dept. of Agr., Richmond, Va.*

"Forage Crops for Central Washington," Agr. Exp. Sta., Pullman, Wash., Bul. 281, *July,* 1933, *H. M. Wanser.*

"Growing Raspberries in West Virginia," Agr. Exp. Sta., Morgantown, W. Va., Cir. 61, *Mar.,* 1933, *H. E. Knowlton and C. R. Orton.*

"Facts for Farmers (Annual Report of the Director 1931-1932)," *Agr. Exp. Sta., Madison, Wis., Bul.* 425, *Mar.,* 1933, *Chris. L. Christensen and Noble Clark.*

"Foundations for Farm Recovery—A Well Informed People," Agr. Exp. Sta., Madison, Wis., Ext. Cir. 255, *Apr.,* 1933.

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Southwest Shows Potash Deficiency

(*From page* 10)

of potash. Even today their total content of potash is many times larger than that of nitrogen and phosphoric acid. But constant cropping has reduced the supply of active potash in the soil to the point of unprofitable yields. Furthermore, our methods of farming have not been of a kind that make inert soil potash available to crops. As a consequence, we have finally reached the point at which successful cropping demands that potash be given equal recognition along with nitrogen and phosphoric acid. Other States reached that stage in their agricultural experience several years ago. Texas is just now getting there.

Soil-Erosion Stations

The erosion-control stations set up by the United States Department of Agriculture to study and develop control methods effective in various types of soil serve not only for research and experiment but also for demonstration and education. At all the stations there is a more or less constant stream of visitors, many of them farmers who are considering terracing land to save it from destructive washing.

The Bethany station in Missouri reports visits by four organized parties within one week this spring. These included two classes in vocational agriculture from Missouri schools, an excursion from the University of Nebraska for all students in Agricultural engineering, and a day of intensive instruction in erosion control for the county agents of 10 Missouri counties. Erosion-control specialists regard these group visits as a particularly effective method of instruction.

Tomato Yield and Quality

(*From page 7*)

100 pounds of muriate of potash or at the rate of 200 pounds of potash per acre over and above that already applied in the 500 pounds per acre of 2-12-6. He kept an exact record of his yields on both the potash plot and on the rest of the field.

The ½ acre with the extra potash yielded 398 baskets weighing 32 pounds per basket, or 6 tons and 736 pounds of tomatoes. The ½ acre yield where the 500 pounds of regular fertilizer were used, but with no extra potash, was 249 baskets, or 3 tons and 1,968 pounds. In other words potash at the rate of 200 pounds per acre in addition to the 2-12-6 added 149 baskets to the ½ acre, or a 60 per cent increase in yield. With potash at $2.50 a hundred and the tomatoes bringing at the cannery 15 cents per basket, each $1 worth of potash returned $9 worth of tomatoes. Grove has the following to say about this crop, "The quality on the potash plot was at least 50 per cent better, and the tomatoes ripened two weeks earlier."

Other Experiences

Floyd Fewell, who delivered his tomatoes to the Dupont Canning Factory, tried the same experiment. His two acres of tomatoes were also grown on Clermont silt loam, locally known as Slash Land. His ground had not been previously manured. Where he used 500 pounds of 2-12-6 per acre, he got 76 baskets from ½ acre. But where he added in addition muriate of potash at the rate of 200 pounds per acre, he picked 103 baskets from ½ acre. In this case the extra potash brought out an additional yield of 27 baskets per acre, or 35 per cent increase. His tomatoes grown with the extra potash were also of better quality, being redder, rounder, smoother, more solid, and earlier maturing. Blight struck the entire patch or he would have had a better yield, yet the potash gave very profitable returns.

C. O. Bear, one of our consistently good tomato growers who invariably has a good yield of tomatoes to deliver, has for a long time been following the practice of plowing under a clover sod and then using 600 pounds per acre of a mixture composed of 400 pounds of 20 per cent superphosphate and 200 pounds of muriate of potash. This is equivalent to applying 1,000 pounds per acre of 0-8-10 fertilizer. This year, Mr. Bear had out four acres of tomatoes and raised the best crop of high quality tomatoes in this section. With eight tons of manure per acre and the fertilizer mentioned above, Mr. Bear actually delivered 2,636 baskets of tomatoes. That figures out 659 baskets per acre, or slightly over 10 tons per acre as an average on the four acres.

Find More Potash Pays

William Leudeman, with the same combination, delivered from one acre 11 tons and 916 pounds of tomatoes, and at the end of the canning season he exhibited several vines showing that all the tomatoes on those vines had actually ripened so that they could be delivered to the factory.

Our growers have found that this type of land, which is common throughout southern Indiana, needs more potash than is obtainable in the 2-12-6. Experience has shown that a mixture that will analyze something like 0-8-10, provided some manure or clover sod is used, greatly increases both the yield and quality, making a double gain in favor of more than the usual amount of potash. Both yield and quality are increased on the average 50 per cent. With this combination of plant foods, tomatoes ripen more evenly, do not rot so readily, are more solid, rounder, smoother; and practically all of them get ripe early enough to deliver to the factory.

The Inquiring Mind

(*From page* 14)

proved of practical importance. Then, under the direction of this "inveterate smoker" and lover of the soothing weed of which Byron wrote, "Sublime tobacco! which, from east to west, cheers the tar's labors or the Turkman's rest," commenced the study of soils with reference to their suitability for tobacco production. It was he who was chiefly instrumental in the establishment of tobacco growing under shade in the Connecticut River Valley, and that plan of cultivation was later adopted with profit in several other sections of the country.

Rescued Fertilizer Industry

Dr. Whitney also directed the Government's work in the fixation of atmospheric nitrogen, and in 1911 he gave his attention to the development of other materials for fertilizing purposes. The subject of fertilizers and their proper use always greatly interested Dr. Whitney. He recognized the necessity of rescuing the fertilizer business from the status of what he facetiously called a "scavenger industry" to that of a true chemical entity and organization. To this end, he inaugurated a vigorous investigation and study of concentrated fertilizers, both as to methods of manufacture and of application, which had most gratifying results.

Relative to this phase of Dr. Whitney's work, the "Official Record" of November 16, 1927, said: "To him fell the burden of administering the fertilizer control work under the Food Control Act, in the years 1919, 1920, and 1921. He approached the task with characteristic vigor, and through the trying post-war days worked early and late for fair treatment of both the farmer and the industry."

The Report further stated that Dr. Whitney was a man of strong convictions, and one whose vision was never obscured by petty disturbances of the immediate present. It was his constant urge upon the younger men, whose privilege it was to work close to him, that they should have the courage of their convictions; not always to be content to follow, but to lead; to realize that universal commendation is rare; and that criticism should not be feared for any work well done. His courageous presentation of his views and conceptions was, probably, the greatest influence he contributed to the furtherance of the scientific study of soils.

An Authentic Writer

Dr. Whitney was the author of numerous scientific articles and papers, published both within and outside the Department of Agriculture. His most notable publication was the book entitled "Soils and Civilization," issued in 1925. It was well received by men in his own lines of effort and by students of soil science, although not of a light and popular type. Francis Bacon once said that "Some books are to be tasted, other swallowed, and some few to be chewed and digested." The Whitney book is of the latter type, and contains much "meat" for the hungry student and for anyone who is interested with observations that have an extensive view. The book may not have been a "best seller," yet it was worth while, and we must agree with the conclusion of Thomas Fuller, who sagely remarked early in the seventeenth century, that "Learning hath gained most by books by which the printers have lost."

From a perusal of its pages, one learns that Dr. Whitney regarded the soil as not the dead, inert, and simple things often referred to as *dirt*. To him it seemed a living thing, having

many of the characteristics of an animal and requiring the same kind of intelligent and sympathetic care as an animal, to keep it in condition to render the most effective service. He compared it likewise to a factory where raw materials are converted into finished products, and asserted that it requires years of training and experience to get the most out of each particular soil type, just as it does to run any kind of factory, or any kind of engine, or to handle any breed of cattle efficiently, mine coal, shoe a horse, lay bricks, or manage a store or business.

Linked Man and Soil

His concept of the soil was a picture or an image, such as an artist might place upon canvas, or the sculptor work out on a piece of marble, or like an architect's concept of a great building, which he visualizes before he begins to draw plans that may have to be changed and modified in detail as the building proceeds. He linked the soil and man closely together in his thinking. He held that failure to maintain an average crop yield over a period of years, ordinarily blamed upon the soil, more correctly should be attributed to the man and the soil, or to their joint effort, in which case the blame should be upon the man, as he is the intelligent and directive head of the partnership. Man, indeed, should be reckoned as a part of the soil and first in the consideration, at least of the productive capacity of the soil.

Dr. Whitney deemed it the duty of the soil scientist to make a diagnosis of soil troubles and to provide the farmer with means whereby he can overcome adverse natural forces and make the soil more obedient to his will and to his needs. He believed that the soil scientist has the same relation to the partnership between man and the soil that a lawyer has to a coroporation, that the chemist has to the steel or dye manufacturer. The soil chemist does not run the farm, for he has not necessarily the experience, the training, or the intuition of the farmer; but he advises how the soil may be handled more efficiently. His training, knowledge, and experience come from observations in the field and in the laboratory. He is constantly attempting to make a complete diagnosis of the soil, to detect abnormalities, to search out weaknesses, and to prescribe methods of attack through which these weaknesses can be overcome.

He taught, too, that all of the important methods of soil control have to do with the control of the respiratory system, the circulatory system, and the digestive system of the soil, and that it is the skill with which these methods are used that makes for success or failure in the handling of the soil to obtain satisfactory results when seeds or plants of good vitality are entrusted to the soil for growth.

Space will not permit us to offer further examples of Dr. Whitney's writings and teachings, or to give in detail an account of his many activities. It should be recorded, however, that in reality he was delightfully genial in his lighter moments and, while ever a student, he could not be said to withdraw himself from his fellow men. Although we are not told that he belonged to any fraternal group, he was a member of an Episcopal church and of many scientific societies, including the Cosmos Club, National Geological Society, American Chemical Society, the Association of Chemists, and the American Soil Survey Association.

Indomitable Courage

Man's span of life is short, at best, and overwork soon weakens bodily strength and endurance. It told on Dr. Whitney as age approached. In March 1925 he suffered a severe attack of angina pectoris, as he was driving to his office. Bravely, he continued his work, suffering much, but endowed with indomitable courage, until release came early on the morning of November 11, 1927, at his home in Takoma Park, Washington.

Throughout his life, and especially

during the two years of his acute illness, the devotion of his loving wife was his stay and comfort, and in death they were not divided. While apparently enjoying perfect health, Mrs. Whitney suddenly was stricken by a heart attack on the afternoon of December 31, 1927, and passed peacefully away.

A tragic ending, to be sure; but a blissful reunion of two noble souls in the haven beyond! They rest in peace.

A Soil Exhibit Carrying a Story

(*From page* 11)

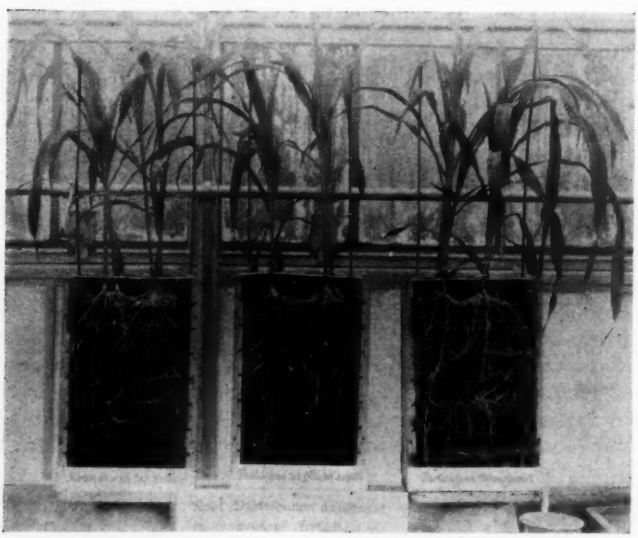
In the series containing all but phosphoric acid, there was material inferiority of growth of plant accompanied by a sparse growth of roots. A reddish tinge of stalks indicated phosphate starvation.

In the fourth series, where potash was the lacking element, growth was much poorer than where the plants received the complete fertilizer. A decidedly undersized growth of crinkly leaves denoted the lack of potash.

Adjacent to the solution bottles were bottles showing carriers of nitrogen, phosphoric acid, and potash used in the making of fertilizers.

At the top of the exhibit were six boxes containing a demonstration of relative rooting systems under different fertility treatments. Two crops, corn and tomatoes, were used in these boxes, in which coarse screen with meshes one-half inch square was inserted from bottom to top. In the first series a 4-8-10 fertilizer was applied with the top three inches of soil. In the second box the same amount of the same fertilizer was mixed with the soil at a depth of 8 to 10 inches. In the third series the same amount of the same fertilizer was mixed throughout the entire soil.

The illustrations show clearly what was to be seen after the soil was removed. The boxes where the fertilizer was applied uniformly throughout show by all odds the greatest root growth. In fact the roots of corn were three inches longer than the entire depth of the boxes and the roots were much more abundant throughout. This was true with regard to tomatoes.



Root studies of corn—Left, fertilizer in the top three inches of soil; center, fertilizer at a depth of 10-12 inches; right, fertilizer throughout.

It is unwise to attempt to draw extensive conclusions from these demonstrations; still they would

appear to illustrate one or two points. It would appear that for corn, if the seedbed is mellow and deep, best results can be obtained by mixing the fertilizers with the seedbed fairly deeply and thoroughly.

Adjacent to the solution and rooting studies was an exhibit of the results of pasture treatment. Two areas of sod were removed from the pasture of Mr. E. Ackert, Holyrood, Ontario, one from a fertilized area, the other from the unfertilized. In 1931 the fertilized field of 17 acres on Mr. Ackert's farm received an application of phosphate and potash with a spring addition of nitro-chalk. About the end of May 1932 there was a very great difference in the pasturage on the two fields. Clover and grass were nearly knee deep on the fertilized area. Actual cuttings showed a difference of more than 8,000 lbs. green weight per acre. Mr. Ackert reported that whereas the unfertilized pasture required five acres to the head, the fertilized pasture maintained almost two head to the acre.

There was a tremendous difference in the herbage as shown by the sod blocks which were on exhibit and which had been placed in the greenhouse when growth stopped last fall. Both areas were watered as required but not in excess. At the time of the exhibit in January, there was a thick mat of clover at least four inches high on the fertilized area. On the unfertilized there was a sparse growth of herbage composed of scanty, thin grass, narrow-leafed plantain (fairly plentiful), dandelion, wild strawberries, and other weeds. Experimental Union members were most interested in this exhibit and saw clearly in a practical way the different results which can be obtained by proper feeding of pasture.

The remaining part of the exhibit was taken up with a diagramatic illustration of the necessity of keeping the balance of soil conditions and plant nutrients in order to produce best quality crops. An imitation balance was erected and pans were suspended. The planks of the pan on the left bore the legend: Organic Matter; Proper Soil Reaction; Thorough Tillage; Sufficient Drainage. On them were placed cellophane bags containing carriers of nitrogen, phosphoric acid, and potash. There were also two bags of soil and one of manure.

On the right hand pan were cellophane bags of crops: wheat, barley, beans, peas, clover seed, some ears of corn, and a sheaf of alfalfa. At the back of the scale was an illustrative chart and on either end charts showing the average results obtained in the potato fertility studies which have been in progress during the past four years throughout the Province. The bright green color of the growing crops combined with a judicious choice of colors on the charts lent a pleasing and attractive effect to the whole exhibit.

The consensus of opinion was that interesting points concerning best fertility management had been effectively demonstrated.

O. K.

(*From page 6*)

the forces and events which you are working with and to which you owe allegiance.

Of course that answers only half of the problem. You may feel quite earnestly that some item or statement departs completely from the policy or the inspiration of the cause to which you and others are dedicated. If it goes against the grain to alter a message or delete a precious sentiment because the Chief cannot see it that way, you falter a bit in enthusiasm and become critical of leadership.

But pshaw! We are getting far too serious and involved with a subject that reaches into the infinite depths of philosophy. We started out with Andy Jackson astride a rearing stallion in a park and find ourselves conjuring up multitudes of obstacles to the solace of a satisfying and well-earned O. K.

IF human nature chooses to take scraps of paper, bits of blue-print, pieces of plaster, chips of wood, and bits of mosaic to work up into what each man believes to be art and success, why should we quibble with him over perfection? Each shop, each office, each home has its own brand of perfection or excellence. You are not going to get any large number of folks to agree at any one time on the result unless you are a genius.

But in the midst of these trying times of reconstruction we are eyewitness to a marvel worth stating. It is this: that the national capital has been filled with carloads of the mighty magnates and O. K. stampers of America coming down to wait their turn themselves for a star-spangled O. K. from the social-minded administration.

The private schemes and bitter rivalry among O. K. demons in business and economics has run its course toward a dead-end wall. All the petty plans and selfish maneuvers which once kept many thousand OK-ees shivering in ante-rooms have swept on to their destined finish. We are changing over from selfish seriousness to social seriousness. Things are happening easily that were laughed off the boards two years ago. The old eagle screams in hoarse acclaim because America has found itself and is resolved to write an O. K. where it will be seen and respected. Roosevelt has said to the old order of freebooters, "If you can't write your own O. K. for the benefit of the many, let Uncle Sam have a chance."

We have known for some time that America was not O. K. The preachers told us it was lack of religion and sanctity. The economists had various versions, illustrated with charts. Some lawyers claimed it was too many courts, others too many or too few statutes. The drys had a reason; the wets had more. The average citizen out of work said it was bread and meat and raiment and shelter; and that religion, law, order, and beverages were secondary issues.

By this time it looks as though material human wants have won, or at least that they are worth considering as the first stroke in making our flourishing O. K. signature to the national proclamation of prosperity.

The common man on the street who never wanted to beg is going to get a chance perhaps to earn something. He will pump blood into the arteries of commerce—he and nobody else. We have given the big bankers the job and they failed miserably, being the worst hoarders and the niftiest O. K. artists we had.

SO perforce if this O. K. furore takes hold as it is expected to, we shall erelong see this—that the well-fed, job-holding man will easily get religion again and be O. K.; that the laws will be respected more and be O. K.; and that we shall depend more upon happy home circles and less upon charts and curves and that will be O. K.

After all, there is more sentiment and psychology to any O. K. than hard sense and fundamental truth. So let's pass the word on and take the crepe off the doors. After four years of wailing and wondering, maybe we can help ourselves after all. If so, might it not be well to let O. K. stand for Our Konquest?

Teacher: "Johnny, why does Missouri stand at the head of mule-raising of the United States?"

Johnny: "Because the other end is dangerous."

APPEARANCE

Two spinsters were discussing men. "Which would you desire most in a husband—brains, wealth, or appearance?" asked one.

"Appearance," snapped the other, "and the sooner the better."

Little Betty, returning from school one afternoon, said:

"Johnny Wilson's examination papers were so good that the teacher keeps them on her desk to show visitors."

Asked about her own, she had to confess that they weren't good.

"But why aren't yours as good as Johnny's?" her mother asked. "You have the same opportunities."

"I know, mother," said Betty, "but Johnny Wilson comes from a very bright family."—*Sante Fe.*

There are at present two kinds of business men. One kind is selling out, and the other kind is out, selling.

An old negro preacher was explaining to his congregation the difference between faith and knowledge.

"Now, my bredren," he said, "hit's like dis: Dar's Brudder Johnsing a-sittin' on de front seat wid Sister Johnsing, and de five little Johnsings. She knows dey's her chillen—dat's knowledge. He believes dey's his chillen—dat's faith."

You can't tell me how far a couple has gone in a car merely by looking at the speedometer!

CAME THE TAXI

"Would you mind walking the other w'y and not passing the 'orse?" said a London cabman with exaggerated politeness to the fat lady who had just paid a minimum fare.

"Why?" she inquired.

"Because, if 'e sees wot 'e's been carryin' for a shilling 'e'll 'ave a fit."

"I want a nice present for my husband. What do you advise?"

"May I ask how long you have been married, madam?"

"Oh, about fifteen years."

"Bargain counter in the basement, ma'am."—*Wroe's Writings.*

Negro Undertaker (over telephone): "Rastus, your mother-in-law just died."

Rastus: "Is you sure 'bout dat?"

Negro Undertaker: "Shall I bury her or embalm her?"

Rastus: "Don't let's take no chances, brother. Cremate her!"

Easy: "Has opportunity ever knocked at your door?"

Mark: "No, but I certainly am on its mailing list!"—*Exchange.*

"Had a terrible time with my flivver."

"Yeah?"

"Yep. Bought a carburetor that saved 50% of gas, a timer that saved 30%, and a spark plug that saved 20%, and after I went ten miles my gas tank overflowed!"

From The Chicago Tribune—

POTATOES SOGGY? THEN BLAME IT ON THE GROWER

The cook probably gets blamed when the potatoes are "heavy and soggy," but proper blame is due the grower in most instances, according to tests of cooking qualities recently conducted by Ralph Donaldson, Massachusetts State college agronomist.

Low protein and high starch content in potatoes produces the desirable white and mealy cooked potato, it has been found. Cooking swells the starch grains and causes them to burst, but if the protein content is high then the starch does not function as usual and the soggy condition results.

Thoroughly mature "spuds" are the first requirement which is being described to potato growers. Properly fed soils, high in potash and relatively low in nitrogen, encourage the crop to desirable starch content.

Potatoes remove from the soil more potash than both nitrogen and phosphoric acid combined. Make sure your fertilizer contains plenty of potash. POTASH PAYS!

N.V. POTASH EXPORT MY., Inc., Buckingham Bldg., CHICAGO

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